

REMARKS

Pursuant to Applicant's election of Claims 1-47 for prosecution, responsive to Examiner's restriction requirement of November 16, 2005, Claims 1-47 are pending and Claims 48-54 are withdrawn from consideration. Applicant reserves the right to file a continuation application or take such appropriate action as deemed necessary to protect the non-elected inventions. Applicant does not hereby abandon or waive any rights in the non-elected inventions.

Base Claims 1, 22 and 44 have been amended to further clarify the scope of the invention by including the limitation, in the same or similar language, "allowing light from the light source to pass from at least a plurality of an inner surface of the sleeve through an outer surface of the sleeve." Applicants note that a "plurality" should be understood, under a common definition, to mean "a larger or greater part" or "more than half of a whole." Thus, amended base claims 1, 22 and 44 require light to pass through at least a greater part of the surface of the sleeve. Support for this claim amendment is found at least on page 7, lines 16-26 and Fig. 1B of the specification as originally filed, where a light source 12 is surrounded by a transparent, thermal insulating sleeve 14, and light may pass from the light source 12 through the entire inner surface of the sleeve 14. With this amendment, no new matter is added; acceptance is respectfully requested.

Base Claims 1, 22 and 44 have also been amended to include the limitation, in the same or similar language, "a reflector surrounding the outside of a substantial portion of said insulating sleeve and directing light into said edge of the planar waveguide, said reflector being coupled to the planar waveguide." Support for this limitation is found at least on page 7, lines 16-30 and Fig. 1B of the specification as originally filed. With this amendment, no new matter is added; acceptance is respectfully requested.

Claims 3 and 26 have been cancelled. As indicated above, limitations similar to those recited in Claims 3 and 26 have been included in respective base Claims 1 and 22 as now amended. Accordingly, Claims 4, 5, 27 and 28 have been amended to depend from one of Claims 1 and 22. With these amendments, no new matter is added; acceptance is respectfully requested.

Rejection of Claims 1-47 under 35 U.S.C. § 103(a)

Claims 1-47 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Zou et al. (U.S. Patent No. 6,186,649) (“Zou”) in view of one or more of Northrop et al. (U.S. Patent No. 4,924,368) (“Northrop”), Du Pont (U.S. Patent No. 3,673,401), Ato (U.S. Patent No. 6,935,766), Murase et al. (U.S. Patent No. 5,408,387), and Yu et al. (U.S. Patent No. 6,979,112). Applicant respectfully disagrees with these rejections for the reasons set forth below.

Amended base Claims 1, 22 and 44 are directed to methods, apparatus and systems for emitting light through a planar surface. Embodiments of this invention include a light source surrounded by a transparent insulating sleeve, and the outer surface of the transparent insulating sleeve is in contact with a planar waveguide. Light emitted by the light source is transmitted through (i.e. from the inner surface through the outer surface of) the transparent insulating sleeve and directed through the planar waveguide, thus providing an illuminated planar surface (see Specification, page 2, lines 6-14). Base Claims 1, 22 and 44 are directed further to a reflective surface that surrounds a portion of the transparent insulating sleeve and reflects some of the emitted light into the planar waveguide. By providing a transparent insulating sleeve surrounding the light source, the planar waveguide, reflector and other items are less susceptible to the heat generated by the light source (see Specification, page 6, lines 14-21). As a result, the light source can be positioned closer to the planar waveguide, thereby allowing more light to be directed through the planar surface. The present invention provides improved illumination of a planar surface.

Zou et al. describes a system for providing linear illumination. In Fig. 8, fluorescent light 252/254 is partially enclosed by an enclosure 256, with a small opening 262 that allows light to escape (see Zou, column 8, lines 33-50). The enclosure 256 can be reflective, non-reflective or transparent (column 8, lines 41-43). If it is transparent, an additional reflective layer 258 is needed inside the enclosure, in order to ensure that light is transmitted through the opening 262 (column 8, lines 43-46). In addition, Fig. 9 describes a similar device with an “optical waveguide” 316 located near the opening 314.

Examiner asserts that “Zou does not disclose (1) a transparent sleeve allowing light from the light source to pass from an inner surface of the sleeve to an outer surface of the sleeve; or (2) a thermal insulating sleeve.” Office Action, page 3, section 2. Contrary to Examiner’s

assertion regarding (2), however, Du Pont does not suggest a “thermal insulating sleeve” as recited in base Claims 1, 22 and 44.

Du Pont describes a sleeve/jacket for a fluorescent light having “good heat resistance” (see col. 2, lines 1-5). As shown in Fig. 1, the jacket 10 is a thin layer that surrounds the fluorescent light 9. The jacket 10 is described with a thickness of merely 0.020 inches, which allows the jacket 10 to flex in response to pressure on the jacket 10 (col. 2, lines 8-18). An example of this flexure is shown in Fig. 6, where the jacket 10’ is deformed without breakage. In this respect, Du Pont is similar to Northrop in that it describes a protective sleeve that does not break when the light source breaks, thereby containing the debris from the breakage. Due to the jacket 10 being thin and in close proximity to the fluorescent light 9, Du Pont states that the jacket 10 must have “good heat resistance,” meaning that the jacket 10 must resist melting, combusting or deforming due to the heat.

However, heat resistance is a different property from thermal insulation. Thermal insulation is a property of preventing heat from transferring through the insulator. The jacket 10 of Du Pont is, in fact, a poor thermal insulator. Because the walls of the jacket 10 are very thin (i.e., 0.0020 inches), heat would easily pass through it. Du Pont requires this thin jacket 10 in order to flex as shown in Fig. 6, and therefore teaches the use of a poor thermal insulator.

Further, Du Pont makes no suggestion of using a thermal insulating jacket. Base Claims 1, 22 and 44 recite, in the same or similar language, a “planar waveguide having an edge in contact with the outer surface of said insulating sleeve.” Because the waveguide is in contact with the insulating sleeve, the insulating sleeve reduces heat transfer to the waveguide. Such an insulator would have no use in the system of Du Pont because he does not describe any element outside of the jacket 10 from which to insulate. Thus, Du Pont describes a jacket that fails to provide thermal insulation, and fails to suggest a thermal insulating sleeve surrounding a light source.

Due to the shortcomings of Du Pont, Zou and Northrop, no combination of these references, alone or with Ato, would provide the present invention as now recited in base Claims 1, 22, and 44. None of the references teach a thermal insulating sleeve surrounding a light source, nor do they suggest an application of such a thermal insulating sleeve.

Moreover, base Claims 1, 22 and 44 now recite, in the same or similar language, “a reflector surrounding the outside of a substantial portion of said insulating sleeve and directing light into said edge of the planar waveguide, said reflector being coupled to the planar waveguide.” Zou does not disclose such a reflector. Rather, in Fig. 8 of Zou, the enclosure 256 has a reflective layer 258 surrounding the inside of the enclosure, which reflects light through the gap 262 in the enclosure. This reflective layer 256 further prevents light from passing from an “inner surface of the sleeve through an outer surface of the sleeve” as also recited in base Claims 1, 22 and 44. Thus, Zou not only fails to suggest the reflector as now recited in base Claims 1, 22 and 44, but also teaches away from the subject matter of the present invention.

With further regard to the reflector (as originally recited in now-cancelled claims 3 and 26), Examiner asserts, at numbered paragraph 22 of page 11 of the instant Office Action, that “Northrop and Du Pont have sleeves intended to be employed flush with the outer surface of the light source and therefore between the source and reflector.” However, Northrop and Du Pont do not even describe a reflective layer of any type. These references merely describe a protective shield to surround a light source, and make no mention of reflecting light for any purpose. Thus, Northrop and Zou cannot have “sleeves intended to be employed...between the source and reflector” because they do not intend to use a reflector at all. Moreover, the sleeves of Northrop and Du Pont are not flush with a light source. Both references explicitly require a space between the light source and sleeve (See Northrop, col. 4, lines 61-67, and Du Pont, Figs. 1 and 2, showing a space between the light source 9 and jacket 10). This space could potentially accommodate a reflective layer, which could surround the inside surface of the sleeve, as in Zou. Nothing in Northrop or Du Pont suggests that such a reflective layer would require being external to the sleeve. Therefore, no combination of Zou, Northrop and Du Pont suggests a “reflector surrounding the outside...of said insulating sleeve and directing light into said edge of the planar waveguide” as recited in base Claims 1, 22 and 44.

Further, Ato describes a backlight unit for a liquid crystal display, and does not disclose at least “a transparent dielectric thermal insulating sleeve” as claimed. Therefore, Ato, alone or in combination with Zou, Northrop or Du Pont, does not teach or suggest the invention a claimed in base Claims 1, 22 and 44. Because claims 2, 4-21, 23-25, 27-43 and 45-47 depend from one

of base Claims 1, 22 and 44, the foregoing applies, and therefore the claims are not suggested by Ato, Zou, Northrop and Du Pont.

Claims 2, 4-21, 23-25, 27-43 and 45-47 depend from base Claims 1, 22 and 44 and thus are allowable at least for the foregoing reasons. As a result, each and every one of the § 103 rejections of claims 1-47 cannot stand, and Applicants respectfully request that the rejections be withdrawn. In particular, the § 103 rejection of Claims 1, 2, 17, 18, 20, 22, 23, 40, 41 and 43 in view of Zou, Northrop and Du Pont is overcome, as are the following rejections.

Claims 4, 5, 8, 27 and 28 have been rejected under § 103 as being unpatentable over Zou in view of Ato. Claims 6, 7, 29, 30 and 31 have also been rejected under § 103 as being unpatentable over Zou in view of Ato. These claims depend from one of base Claims 1 and 22, and therefore the foregoing remarks apply. No combination of Zou and Ato discloses the claimed “thermal insulating sleeve” (“transparent thermally insulating dielectric sleeve”) of base Claims 1 and 22.

Claims 9, 10, 14, 15, 32, 33, 37 and 38 have been rejected under 35 U.S.C. § 103 as being unpatentable over Zou in view of Murase et al. These claims depend from one of base Claims 1 and 22. Murase does not add to Zou the “thermal insulating sleeve” (“transparent thermally insulating dielectric sleeve”) of base Claims 1 and 22.

Claims 11, 12, 16, 34, 35 and 39 have been rejected under § 103 as being unpatentable over Zou. The above arguments with respect to base Claims 1 and 22 apply where Claims 11, 12 and 16 depend from Claim 1 and Claims 34, 35 and 39 depend from Claim 22. Zou makes no suggestion or disclosure of the claimed transparent thermal insulating sleeve of base claims 1 and 22. By way of their dependency, Claims 11, 12, 16, 34, 35 and 39 inherit the claimed transparent thermal insulating sleeve. Thus, Zou does not make obvious dependent Claims 11, 12, 16, 34, 35 and 39 and withdrawal of these § 103 rejections is respectfully requested.

Claims 13, 19, 36 and 42 are rejected under § 103 as being unpatentable over Zou in view of Yu et al. Yu discloses an acrylic waveguide with concave surfaces or grooves to provide a light incident surface that facilitates the entry of light into the waveguide. These claims depend from base Claims 1 and 22, and thus the foregoing remarks apply. Yu does not add to Zou the transparent “thermal insulating sleeve” of Claims 1 and 22, and therefore does not make obvious dependent Claims 13, 19, 36 and 42.

Claims 21, 24 and 25 have been rejected under § 103 as being unpatentable over Zou in view of so called Applicant's admitted prior art ("APA"). The APA discloses a waveguide and light source as a self-contained unit for use with a display or picture frame. These claims depend from base Claims 1 and 22, and thus the foregoing remarks apply. Yu does not add to Zou the transparent "thermal insulating sleeve" of Claims 1 and 22, and therefore does not make obvious dependent Claims 21, 24 and 25.

Claims 44 and 47 have been rejected under § 103 in view of Zou et al., Ato, Northrup and Du Pont. As discussed above, none of these references individually or in any combination imply or suggest the "transparent dielectric thermal insulating sleeve" as claimed in base Claim 44. Claim 47 depends from Claim 44. Thus Zou in view of Ato and Northrup does not make obvious the claimed invention of Claims 44 and 47. Withdrawal of this rejection is respectfully requested.

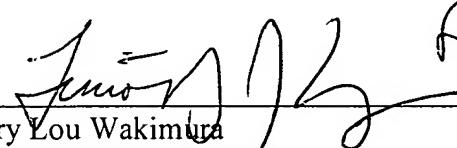
Claims 45 and 46 have been rejected under § 103 as being unpatentable over Zou and Ato as applied to Claim 44. These claims depend from base Claim 44 and thus the foregoing applies. Ato does not add to Zou the "transparent dielectric thermal insulating sleeve" as claimed in base Claim 44, and therefore does not make obvious dependent Claims 45 and 46.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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